

Appl. No. 10/673,225  
Amdt. dated April 20, 2005  
Reply to Office Action of February 9, 2005

### **REMARKS/ARGUMENTS**

The Examiner is correct in that in claim 1, line 6, the second occurrence of "that" should read - - than - -. This has now been corrected.

### **Claim Rejections - 35 USC § 103**

The Examiner has rejected claims 1-12 under 35 U.S.C. 103(a) as being obvious over Park et al. (U.S. Patent Application Publication No. 2004/0042759).

This rejection is respectfully traversed for the following reasons.

Claim 1 of the present application, which is the only independent claim, reads as follows:

1. A large mode field diameter optical fiber which is a single mode fiber having a core and a cladding and wherein the core has an inner core region, at least partially doped with a rare-earth dopant and a co-dopant, and an outer core region at least partially doped with a dopant, the type and amount of the rare-earth dopant and its co-dopant in the inner core region and of the dopant in the outer core region being adapted to achieve a refractive index in the outer core region that is lower than the refractive index of the inner core region so as to produce a large mode field diameter, exceeding 5.5  $\mu\text{m}$  at a wavelength of 1550nm.

This claim provides for the adjustment of the refractive indices between the inner core region doped at least partially with a rare-earth dopant and a co-dopant, and the outer core region also doped with a dopant, so as to produce a large mode field diameter exceeding 5.5  $\mu\text{m}$  at a wavelength of 1550nm.

No such adjustment is either disclosed or is obvious from the Park et al. reference which provides for a large mode field diameter at a wavelength of 1.45 $\mu\text{m}$  (c.f. paragraph [0043] line 11), and restricts its wavelength range to between 1.45 and 1.5 $\mu\text{m}$  (c.f. paragraph [0046]). In fact, Fig. 11 of the Park et al. reference shows that the gain falls off very rapidly after 1500 nm wavelength and therefore it would not be obvious to achieve applicants' results at a wavelength

of 1550 nm by relying on this reference.

The Examiner acknowledged that Park et al. does not expressly disclose the mode field diameter exceeding  $5.5\mu\text{m}$  at a wavelength of 1550 nm, however, she pointed out that Park et al. discloses in the Abstract (and also by the way in claim 1) that its optical fiber may be doped with Erbium and since according to the Examiner, it is well known that Erbium fiber amplifiers provide amplification at 1550 nm, it would be obvious to adapt Park et al. teaching applicants' claims.

This Examiner's reasoning is considered to be incorrect because, first of all, applicant's claim 1 does not even mention Erbium specifically.

Secondly, Park et al. does mention Erbium as one possible element among many others within the RE component of the inner core and does not even indicate that Erbium would be used as  $\text{Er}_2\text{O}_3$ .

Thirdly, Park et al. deals with a very specific combination of elements in the inner core, the outer core and the cladding as indicated in the Abstract and in claim 1, and as already mentioned above, this combination is restricted to the wavelength range of 1450-1500 nm, and there is no teaching or suggestion in Park et al. that it would work at a higher wavelength as claimed by the present applicants.

Regarding claims 2 and 3, the Examiner's statement that it would be obvious to modify Park et al. by providing a plurality of sub-regions in the outer core, is not accepted. As pointed out above, Park et al. provide a very specific composition of the inner core, the outer core and the cladding and there is no indication whatsoever that the outer core could be sub-divided into a plurality of sub-regions, each of which may have a different refractive index. The Examiner's statement that this is well known in the art in a combination such as claimed by the applicant is respectfully traversed and the Examiner is asked to substantiate this statement by reference to the prior art that would make it "well known" and would point that it could be adapted to situations such as set out in Park et al. and would lead to the combination claimed herein.

Claims 4-6 are dependent on claim 1 and thus possess its patentable characteristics. Also, as mentioned above, the present invention deals with adjustments of the inner and outer core regions and their refractive indices to produce the desired mode field diameter at a wavelength

of 1550 nm. This is clearly not disclosed in or obvious from Park et al.

Again, claims 7-12 relate to claim 1, which has been discussed above. Moreover, these claims provide ranges of dopants and co-dopants which are particularly suitable for achieving the desired mode field diameter at a wavelength of 1550 nm, which is neither mentioned in nor suggested by Park et al.

According to MPEP 2143, the basic requirement of a *prima facie* case of obviousness is that "...the prior art reference (or references when combined) must teach or suggest all the claim limitations". Furthermore, according to MPEP 2143.01, the prior art must suggest the desirability of the claimed invention.

It is respectfully submitted that neither of the above conditions has been met by Park et al. With hindsight of applicants' disclosure, the Examiner has combined Park et al. with supposedly well known art (without disclosing from where it is well known) and modified it so that it would somehow fit the present invention. It is not believed that such combination is proper, however, even if such combination and reconstruction could be made, the Examiner should have taken into account the explanatory notes of MPEP 2143.01, where it is stated that "the fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness, unless the prior art also suggests the desirability of the combination (*In re Mills*, 916 F. 2d 680, 19 USPQ 2d 1432, Fed. circ. 1990). This has clearly not been done in the present case.

Moreover, in *In re Lee*, 277 F. 3d 1338, 61 USPQ 2d 1430 (Fed. Cir. 2002), the Examiner used "common knowledge" of one skilled in the art to provide the motivation to combine references. The Federal Circuit disagreed, holding that "subjective belief and unknown authority are improper places to find motivation to combine (at 1434) and further found that obviousness could not be found without "any hint or suggestion in a particular reference".

In addition to the above cogent argument, the applicant wishes to point out that the U.S. filing date of the Park et al. reference (which is the relevant date pursuant to 35 U.S.C. 102(e) and accordingly also pursuant to 35 U.S.C. 103(a)) is **August 12, 2003**. The applicants are enclosing herewith as an Appendix, a declaration under 37 CFR § 1.131 showing that this invention was completed and a patent draft thereof was made by the applicants on **June 2, 2003**

and the first draft of the application was prepared and submitted for review by the applicants on **July 10, 2003**, i.e. prior to the relevant date of the Park et al. reference, which is therefore not applicable against this application.

In view of the above, reconsideration and allowance of this application are solicited.

The Examiner is invited to call Applicant's agent if any questions remain following review of this response.

Respectfully submitted,



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